DETAILED ACTION

1.   This Office action is in response to the amendment filed on May 16, 2008.

2.   **Claims 1, 5-13, 17-25, and 27-30** are pending.

3.   **Claims 1, 5, 11-13, 16, 17, 23-25, 27, and 29** have been amended.

4.   **Claims 2-4, 14-16, 26, and 31** have been cancelled.

5.   **Claims 1, 5-13, 17-25, and 27-30** are allowed, renumbered as 1-23.

6.   The objections to Claims 5, 12, 16, 17, and 24 are withdrawn in view of Applicant's amendments to the claims or cancellation of the claims.

7.   The 35 U.S.C. § 112, second paragraph, rejections of Claims 1, 3-13, and 15-31 are withdrawn in view of Applicant's amendments to the claims or cancellation of the claims.

Examiner's Amendment

8.   An Examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to Applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

        Authorization for this Examiner's amendment was given in a telephone interview with Raymond Y. Mah (Reg. No. 41,426) on June 4, 2008.

        The application has been amended as follows:

AMENDMENTS TO THE CLAIMS

Please cancel Claims 3, 4, 15, 16, 26, and 31 and amend Claims 1, 13, 25, 27, and 29 as

follows:

1. (currently amended) A control program testing method for testing a control program

which is written in a certain programming language by use of an automatic code generator which

produces automatically a control program which is corresponding in contents with a control

model indicating a control specification and written in the certain programming language to

perform the control model, with requisite control specifications thereof being written in a

requisite control specifications writing language, the control program testing method comprising

steps of:

producing operation results of a simulator which simulates operation of the control model

and operation results of program execution section which executes the control program, while

making a relational linkage between each of corresponding operation results; ~~and~~

comparing the operation results of the simulator and the operation results of the program

execution section upon detecting suspends of simulation and program execution; and

testing presence or absence of abnormality in at least one of the control model and the

control program with respect to each relational linkage;

wherein said each relational linkage is made about corresponding contents between the

control model and the control program based on correspondence information which indicates a

correspondence relationship between the control model which is provided at automatic

generation of the control program by the automatic code generator and the control program

which is produced from the control model,

wherein the relational linkage is made for one of the control model and the control

program based on the setting of a break point which specifies a suspend point of operation and

for the other based on a setting of a corresponding break point based on the correspondence

information, and

wherein the break point is adapted to set individually for functional blocks which

constitute the control model.

3. (canceled)

4. (canceled)

13. (currently amended) A control program testing apparatus for testing a control

program which is written in a certain programming language by use of automatic code

generation means which produces automatically a control program which is corresponding in

contents with a control model indicating a control specification and written in the certain

programming language to perform the control model, with requisite control specifications thereof

being written in a requisite control specifications writing language, the control program testing

apparatus comprising:

synchronizing means which produces operation results of simulation means which

simulates operation of the control model and operation results of program execution means

which executes the control program, while making a relational linkage between each of

corresponding operation results, the simulation means and the program execution means being

operated concurrently; ~~and~~

comparing means for comparing the operation results of the simulation means and the

operation results of the program execution means upon detecting suspends of simulation and

program execution; and

testing means for testing presence or absence of abnormality in at least one of the control

model and the control program based on output operation results with respect to each relational

linkage;

wherein the synchronizing means makes said each relational linkage about corresponding

contents between the control model and the control program based on correspondence

information which indicates a correspondence relationship between the control model which is

provided at automatic generation of the control program by the automatic code generation means

and the control program which is produced from the control model,

wherein the synchronizing means makes the relational linkage for one of the control

model and the control program based on the setting of a break point which specifies a suspend

point of operation and for the other based on setting of a corresponding break point based on the

correspondence information, and

wherein the break point is set individually for functional blocks which constitute the

control model and the synchronizing means causes simulation means and the program execution

means to operate in a synchronized manner.

15. (canceled)

16. (canceled)

25. (currently amended) A computer readable medium tangibly storing therein a control program testing program which is used for testing a control program which is written in a certain programming language by use of an automatic code generator which produces automatically a control program which is corresponding in contents with a control model indicating a control specification and written in the certain programming language to perform the control model, with requisite control specifications thereof being written in a requisite control specifications writing language, the control program testing program, upon execution through a computer, performing steps comprising:

testing presence or absence of abnormality in at least one of the control model and the control program;

generating, from information provided at automatic generation of the control program, correspondence information which indicates a correspondence relationship between the control model and the control program, and making a relational linkage between each of a plurality of suspend points of operation of a simulator which simulates the control model and a corresponding one of a plurality of suspend points of operation of program execution section which executes the control program based on the correspondence information;

directing the simulator and the program execution section to proceed to the simulation and the program execution;

detecting a suspend of the simulator and a suspend of the program execution section

following the simulation and program execution; and

comparing a simulation result of the control model and an execution result of the control

program upon detecting suspends of simulation and program execution, and testing the presence

or absence of abnormality based on the comparison result with respect to each relational linkage;

wherein said each relational linkage is made about corresponding contents between the

control model and the control program based on correspondence information which indicates a

correspondence relationship between the control model which is provided at automatic

generation of the control program by the automatic code generator and the control program

which is produced from the control model,

wherein the correspondence information includes execution position correspondence

information which is information indicating the relationship between corresponding positions of

the control model and the control program, and

wherein the making a relational linkage of suspend points based on the correspondence

information is that which sets, by being rendered the setting of a break point which specifies a

suspend point of operation of one of the simulator and the program execution section, a break

point which specifies a corresponding spot of the other based on the execution position

correspondence information.

26. (canceled)

27. (currently amended) The computer readable medium tangibly storing therein a control program testing program as in claim [[26]]25,

wherein the testing of the presence or absence of abnormality based on the comparison result tests the presence or absence of abnormality by at least comparing one of the suspend points of simulation of the control model and one of the suspend points of execution of the control program based on the execution position correspondence information.

29. (currently amended) A computer readable medium tangibly storing therein a control program testing program which is used for testing a control program which is written in a certain programming language by use of an automatic code generator which produces automatically a control program which is corresponding in contents with a control model indicating a control specification and written in the certain programming language to perform the control model, with requisite control specifications thereof being written in a requisite control specifications writing language, the control program testing program upon execution through a computer, performing:

testing of presence or absence of abnormality in at least one of the control model and the control program;

generating, from information provided at automatic generation of the control program, correspondence information which indicates a correspondence relationship between the control model and the control program, and making a relational linkage between each of a plurality of suspend points of operation of a simulator which simulates the control model and a corresponding one of a plurality of suspend points of operation of program execution section which executes the control program based on the correspondence information, the testing of

presence or absence of abnormality in at least one of the control model and the control program being made with respect to each relational linkage;

directing the simulator and the program execution section to proceed to the simulation and the program execution;

detecting a suspend of the simulator and a suspend of the program execution section following the simulation and program execution; and

producing a simulation result of the simulator and an execution result of the program execution section upon detecting suspends of simulation and program execution, and testing the presence or absence of abnormality based on a comparison result with respect to each relational linkage;

wherein said each relational linkage is made about corresponding contents between the control model and the control program based on correspondence information which indicates a correspondence relationship between the control model which is provided at automatic generation of the control program by the automatic code generator and the control program which is produced from the control model,

wherein the correspondence information includes execution position correspondence information which is information indicating the relationship between corresponding positions of the control model and the control program, and

wherein the making a relational linkage of suspend points based on the correspondence information is designed to set, by being rendered the setting of a break point which specifies a suspend point of operation of one of the simulator and the program execution section, a break

point which specifies a corresponding spot of the other based on the execution position

correspondence information.

31. (canceled)

-- END OF AMENDMENT --

Reasons for Allowance

9.   The following is an Examiner's statement of reasons for allowance:

The cited prior art taken alone or in combination fail to teach, in combination with the

other claimed limitations, "wherein the relational linkage is made for one of the control model

and the control program based on the setting of a break point which specifies a suspend point of

operation and for the other based on a setting of a corresponding break point based on the

correspondence information, and wherein the break point is adapted to set individually for

functional blocks which constitute the control model" as recited in independent Claims 1 and 13;

and further fail to teach, in combination with the other claimed limitations, "wherein the

correspondence information includes execution position correspondence information which is

information indicating the relationship between corresponding positions of the control model and

the control program, and wherein the making a relational linkage of suspend points based on the

correspondence information is that which sets, by being rendered the setting of a break point

which specifies a suspend point of operation of one of the simulator and the program execution

section, a break point which specifies a corresponding spot of the other based on the execution

position correspondence information" as recited in independent Claims 25 and 29.

The closest cited prior art, the combination of US 6,708,329 (hereinafter "Whitehill"), US

2002/0174415 (hereinafter "Hines"), and US 6,587,995 (hereinafter "Duboc"), teaches a

computer system for translating simulation system modules utilized to model behavior of a target

system into modules compatible with a target system platform for controlling the target system to

act in accordance with the simulation. However, the combination of Whitehill, Hines, and Duboc

fails to teach "wherein the relational linkage is made for one of the control model and the control

program based on the setting of a break point which specifies a suspend point of operation and

for the other based on a setting of a corresponding break point based on the correspondence

information, and wherein the break point is adapted to set individually for functional blocks

which constitute the control model" as recited in independent Claims 1 and 13; and further fails

to teach "wherein the correspondence information includes execution position correspondence

information which is information indicating the relationship between corresponding positions of

the control model and the control program, and wherein the making a relational linkage of

suspend points based on the correspondence information is that which sets, by being rendered the

setting of a break point which specifies a suspend point of operation of one of the simulator and

the program execution section, a break point which specifies a corresponding spot of the other

based on the execution position correspondence information" as recited in independent Claims

25 and 29.

Any comments considered necessary by Applicant must be submitted no later than the

payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for

Allowance."

Conclusion

10.   The prior art made of record and not relied upon is considered pertinent to Applicant's

disclosure.

Any inquiry concerning this communication or earlier communications from the

Examiner should be directed to Qing Chen whose telephone number is 571-270-1071. The

Examiner can normally be reached on Monday through Thursday from 7:30 AM to 4:00 PM.

The Examiner can also be reached on alternate Fridays.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's

supervisor, Wei Zhen, can be reached on 571-272-3708. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the TC 2100 Group receptionist whose telephone number is 571-272-2100.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/QC/
June 4, 2008

/Wei Zhen/

Supervisory Patent Examiner, Art Unit 2191